AMENDMENTS TO THE SPECIFICATION

On page 10, line 19 (paragraph 0044) is amended as follows:

~~Figure 2 shows the diagram~~ FIGS. 2a-2d are diagrams illustrating the proposed method.

On page 11, lines 5-11 (paragraph 0050) are amended as follows:

The present ~~Present~~ invention, (see FIG. 1) with the purpose of increasing permeability of the well bore region (12) of oil, gas and/or water ~~wells~~ wells, proposes a method and device for stimulating said region (12) with mechanical vibrations, with an end to promoting the formation of shear vibrations in said extraction zone due to the displacement of phase in the mechanical vibrations produced along the axis of the well, achieving alternately tension and pressure due to the superposition of the longitudinal and shear waves, and stimulating in this way the occurrences of mass transference processes within the well.

The oil, gas and/or water wells comprise a metal pipe or casing (10), cement (19) between the casing (10) and the well bore region (12), an inner metal pipe or tubing (11) inside the casing (10), and a packer (15) between the casing (10) and the tubing (11). The casing (10) near the well bore region (12) is perforated with a machine that produces holes (13) in the casing (10) and fissures (14) in the cement (19) and in the well bore region (12), to allow the fluids from the well bore region (12) to flow to the well.

The extraction zone of the well consists of a liquid phase (18) made of oil and/or water, and a gas phase (16) above the level (17) of the liquid phase (18). The electroacoustic device (20) is lowered to the extraction zone of the well with a logging cable (22).

The paragraphs from line 12 of page 11 to line 9 of page 12 (paragraphs 0051-0054) are amended as follows:

This last can be illustrated by the diagrams presented in ~~FIG. 2, where~~ FIGS. 2a-2d. FIG. 2a shows the vector of oscillating velocity $V^R{}_1$ (45) of longitudinal vibrations that propagate in the radiator (46), is directed along the axis of the radiator, while the amplitude distribution of vibratory displacements $\xi^R{}_{ml}$ (47) of longitudinal vibrations also propagate along the radiator. In lieu of this, as a result of the Poisson effect, radial vibrations are generated in the radiator (46) with a characteristic distribution with a displacement amplitude of [[$\xi^R{}_{mK}$]] $\xi^R{}_{nV}$ (48).

~~The~~ FIG. 2b shows the radial vibrations through the radiating surface (49) of the radiator (46) are transmitted into the well bore region (50). The speed vector $V^Z{}_1$ (51) of the longitudinal vibrations propagate in the well bore region (50) in a direction perpendicular to the axis of the radiator. ~~Diagram~~ Waveforms 52 ~~shows~~ show the characteristic radial distribution of the displacement amplitudes $\xi^Z{}_{ml}$ (501) of the radial vibrations propagating in the extraction region (50) and radiated from points of the radiator

localized at a distance equal to $\lambda/4$ (where ~~a~~ λ is the wavelength of the longitudinal wave in the radiator material).

~~The~~ FIG. 2c shows the phase shift of the radial vibrations propagating in the medium leads to the appearance of shear vibrations in the well bore region, whose vector of oscillating velocity [[$V^R{}_{IS}$]] $\underline{V^Z{}_S}$ (53) is directed along the radiator axis. ~~Diagram~~ Graph 54 shows the characteristic distribution of displacement amplitudes of shear vibrations [[$\xi^Z{}_{mZ}$]] $\underline{\xi^Z{}_{mS}}$.

As a result (see FIG. 2d), an acoustic flow (55) is produced in the well bore region (50) due to the superposition of longitudinal and shears waves with speed (U_f) and characteristic wavelength $\lambda/4$.

The paragraph from line 17 of page 12 to line 2 of page 13 (paragraph 0057) is amended as follows:

The closed case (200) is constructed with a material that transmits the vibrations. The casing (200) has two sections, an upper case (23) and a lower case (201). The lower case (201), at its furthest end has two internal cavities (25) and (302). Cavity (25) communicates with the exterior by means of small holes (26). The fluid (18) to be recovered from the well bore region, may flow through these small holes (26) into the cavity (25). This fluid, once it has filled the internal cavity (25), allows to compensate the pressure in the well bore region with that of the device (20) ~~(29)~~. The internal cavity (302) is flooded

with a cooling liquid (29), which acts on an expansible set of bellows (27), which in turn allow the expansion of it into the compensation area (28) of the lower case (201).

On page 13, lines 3-6 (paragraph 0058) are amended as follows:

Over the compensation chamber (302), there lies a second chamber (301), named "stimulation chamber", placed in the stimulation zone (34) of the lower case (201). The stimulation zone (34) has holes (35) which allow to increase the level of transmission of acoustic energy to the formation (12).

On page 13, lines 7-16 (paragraph 0059) are amended as follows:

Both chambers (301 and 302) in turn form a great chamber ~~(39)~~ (30) that houses the wave guide or sonotrode comprising a radiator (31). Said radiator (31) has a tubular geometric shape with an outer diameter D_0 its nearer end having the shape of a horn (32) placed within the stimulation chamber (301), while its further end has the shape of a hemisphere (33) with an inner diameter of $D_0/2$, placed inside the compensation chamber (302). Both chambers are sealed by a perimetrical flange (44) which in turn sustains the hemisphere shaped end (33) of the radiator (31). The geometric dimensions of the tubular part of the radiator (external diameter "D_0", length "L" and wall thickness "δ") are determined by the working conditions under resonance parameters of longitudinal and radial

vibrations in the natural resonance frequency of the electro acoustic transducer (36).

On page 13, lines 23-24 (paragraph 0062) are amended as follows:

To better the cooling system, the electro acoustic transducer (36) is constructed in two parts (not shown in <u>FIG. 3</u> ~~figure 2~~).

On page 14, lines 1-5 (paragraph 0063) are amended as follows:

The coil (37) is connected adequately with an electrical conductor (38) extended from the power source (39) placed in a separate compartment (40) within the upper case (23). The power source (39) is fed from the surface of the well by conductors (21) in the logging cable (22). The power source (39) and the transducer (36) are cooled with liquids (41) existent in compartments that contain them (40 and 42 respectively). <u>The compartments (40 and 42) are separated by a perforated disk (43).</u>

On page 14, lines 12-17 (paragraph 0066) are amended as follows:

Figure 5 shows another modality for developing the specified principle for formation of longitudinal and shear waves in the well bore region, where the electro acoustic device <u>(20)</u> ~~(29)~~ includes 2 or 2n (where n is a whole number) vibratory systems (58 and 59), for which the electro acoustic transducers of each pair operate in phase and every pair next to the vibratory

system operates in antiphase with respect to the previous vibratory system.

On page 14, lines 22-23 (paragraph 0069) are amended as follows:

To increase the operating efficiency of a tubular radiator, its construction is modified in the way shown in FIGS. 6 and 6a. ~~figures 6 and 7.~~